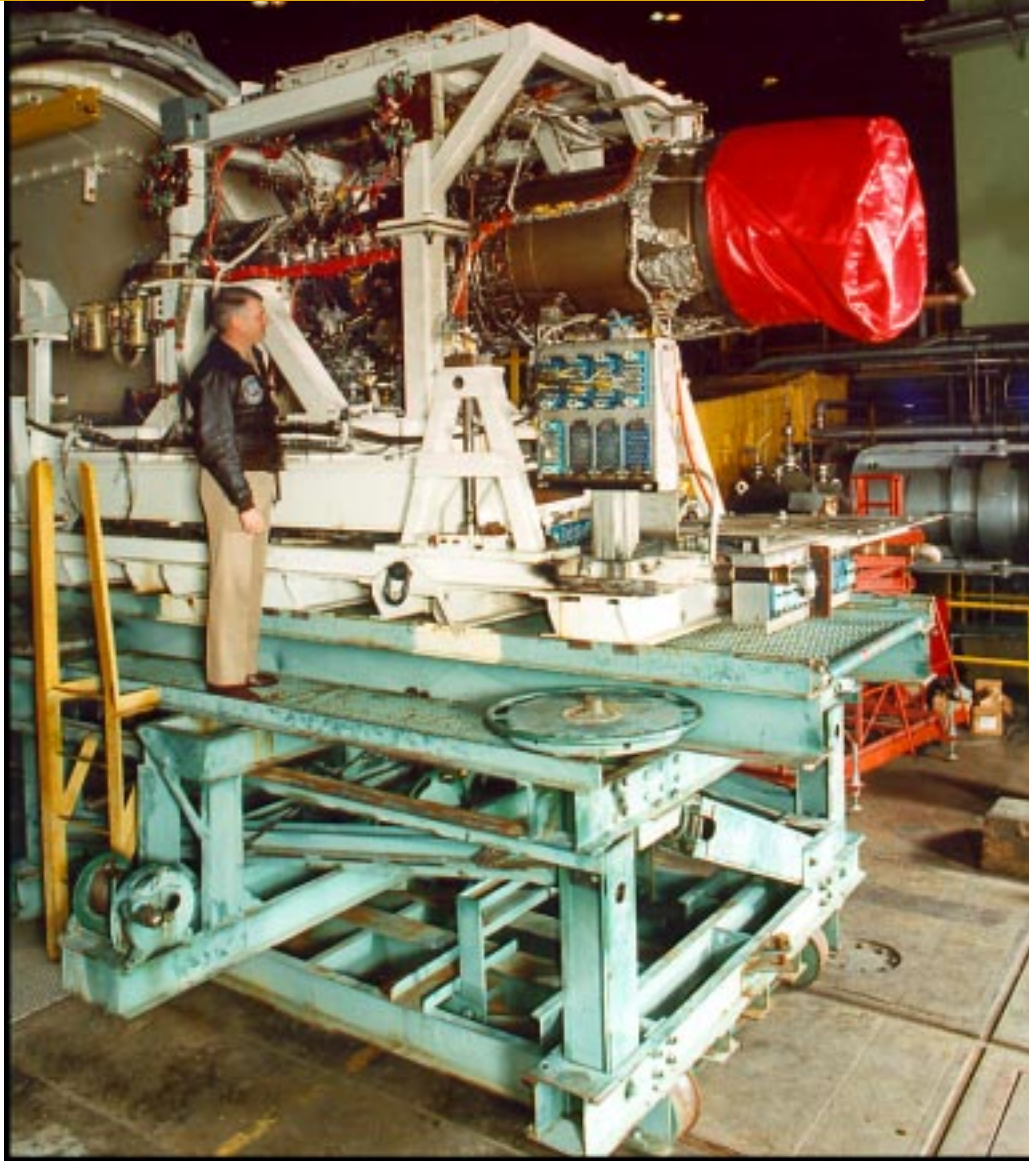


## ***ENGINE TEST FACILITY***

### ***Propulsion Development Test Cell T-4***



T-4, located at Arnold Engineering Development Center, Arnold Air Force Base, Tennessee, is an altitude test cell used to perform turbojet, turbofan, turboshaft, ramjet, aerodynamic models, or combined aerodynamic inlet and propulsion system tests. Fixed Mach Number Free Jet, or Direct-connect tests of air-breathing propulsion systems to a simulated Mach number of 3.0 can be accomplished.

# PROPULSION DEVELOPMENT TEST CELL T-4

## Test Cell Dimensions:

Length: 39 to 47.8 ft (variable)

Diameter: 12.3 ft

Inlet Plenum Diameter: 7 ft

## Environmental Capabilities:

Altitude (ft): Sea Level to 80,000

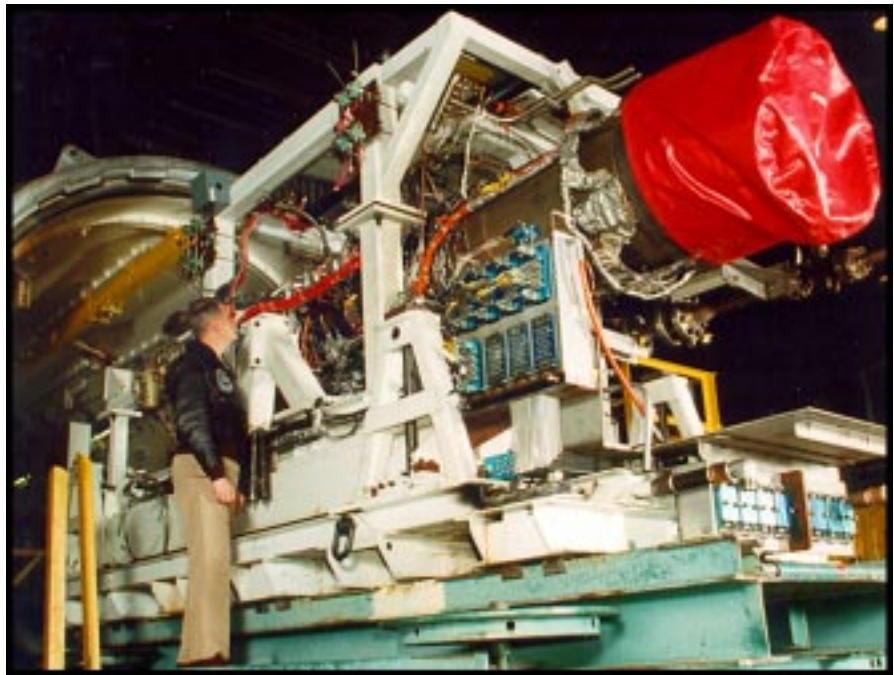
Total pressure (psia): up to 70  
at the air inlet to the test cell

Total Temperature (°F): -80 to 650

Airflow (lb/sec): 0 to 800

Fuel Temperature Conditioning  
System (°F): -70 to 225

Installed Thrust Stand Capacity  
(lbs): 50,000



## Soak Capabilities:

Maximum Temperature (°F): 170

Minimum Temperature (°F): -65

**Note:** Entire test cell is not brought to temperature, but instead, engine is enclosed in a special set-up box that is brought to temperature.

Soak duration is unlimited.

## Power Absorption:

T-4 has a 600 Hp extraction water brake that can be used in this cell.

## Data Processing Capabilities:

ETF data processing capabilities provide pre-test, test, and post-test data reduction and analysis.

General programs are available for processing data acquired by the digital data acquisition system. These programs calculate calibration factors, convert raw data to engineering units, calculate performance analysis parameters, generate hard copy tabulations and plots, provide interactive alphanumeric and graphics displays, and supply inputs for special-purpose processing programs. New programs may be developed as needed to meet specific test-unique data reduction and analysis requirements. In

addition to real-time displays, data available for analysis/review during testing include all steady-state condition parameters and selected portions of time-dependent parameters. General data reduction programs are available for off-line processing of data recorded in the form of frequency-analog signals.

## Unique Features:

- An icing system exists for this cell. Engine icing tests can be performed with Direct -connect or free jet installations.
- The test cell is equipped with a high-pressure auxiliary air supply (up to 30 lb/sec from the 4000-psi system).

## INSTRUMENTATION CAPABILITIES:

| Steady State        | Temperature                       | Pressure             |
|---------------------|-----------------------------------|----------------------|
| Number of Channels: | 288+                              | 300+                 |
| Range:              | -300 to 3000°F                    | 5 to 600 psia/Varies |
| Sampling Rate       | -----20+ samples/sec/channel----- |                      |

| Transient           | Temperature                        | Pressure | Vibrations |
|---------------------|------------------------------------|----------|------------|
| Number of Channels: | 288+                               | 200+     | 30+        |
| Range               | -300 to 3000 °F                    | Varies   | Varies     |
| Sampling Rate:      | -----200+ samples/sec/channel----- |          |            |

*For more information on Engine Test Facility - Propulsion Development Test Cell T-4 at Arnold Engineering Development Center, Arnold Air Force Base, TN, contact 615-454-5851.*